(No Model.) 2 Sheets—Sheet 1.

W. J. NORWOOD.

WASHING MACHINE.

No. 453,777. Patented June 9, 1891.

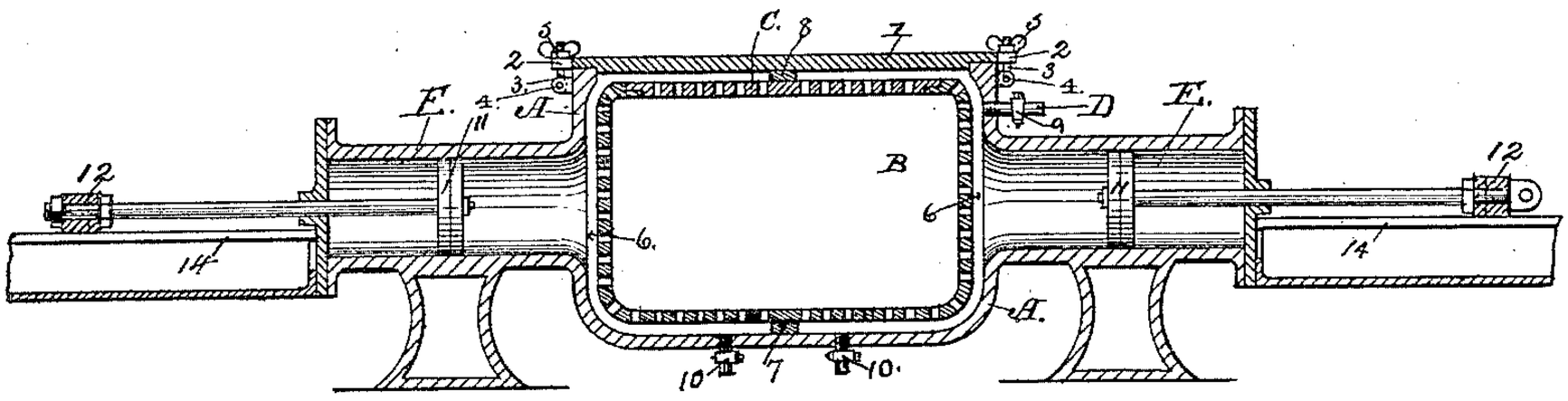

FIG. 1.

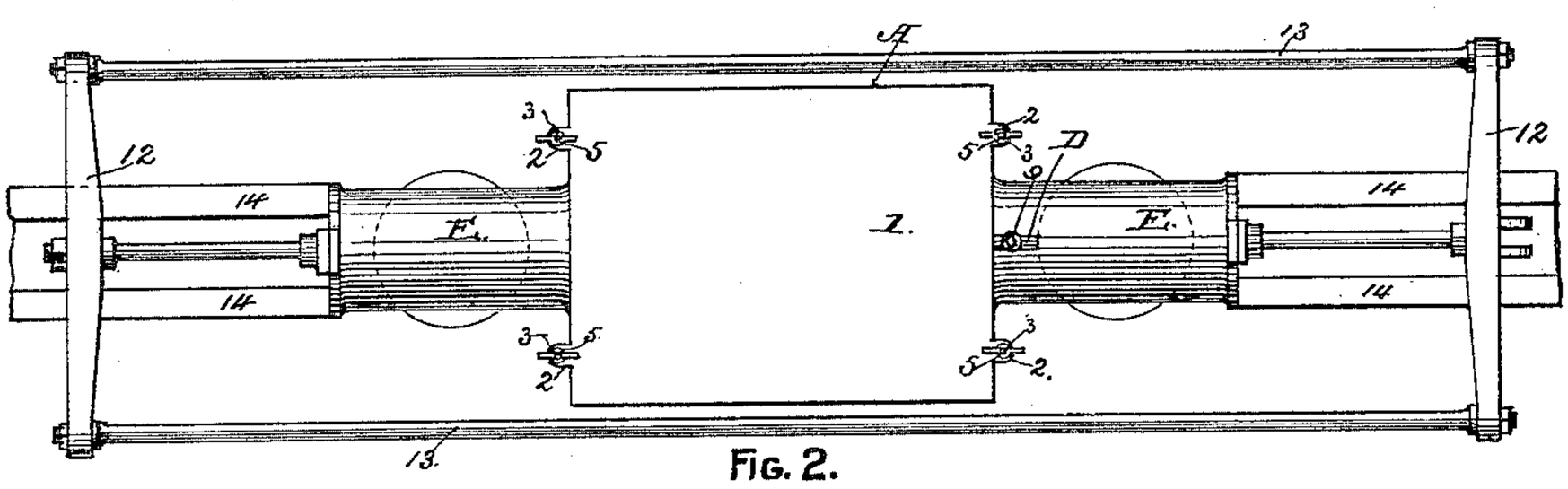

FIG. 2.

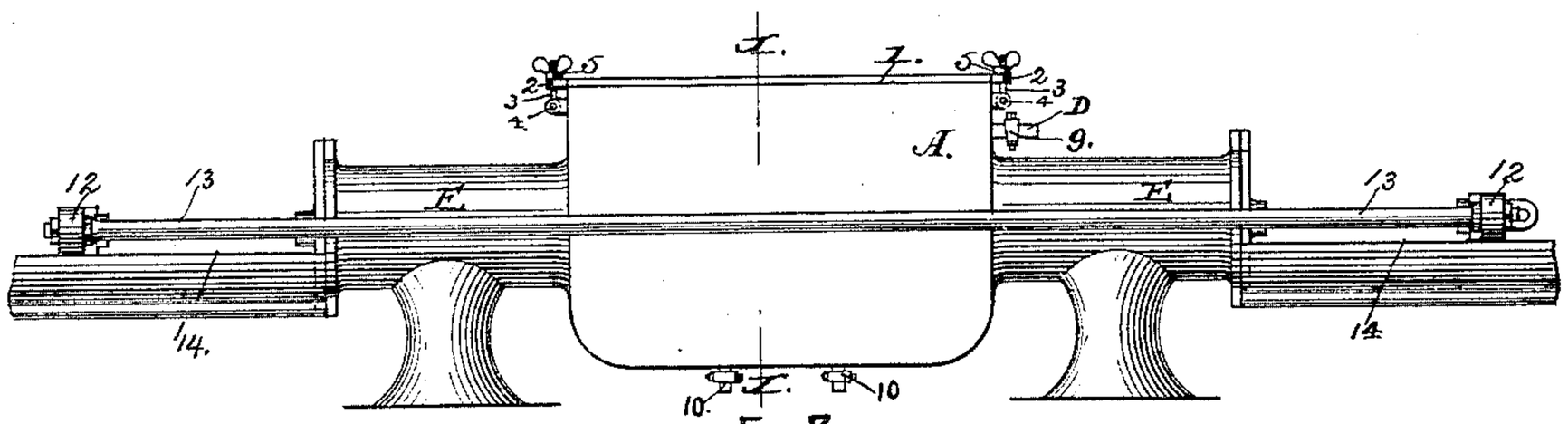

FIG. 3.

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INVENTOR:

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BY William M. Lowe.

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(No Model.) 2 Sheets—Sheet 2.

W. J. NORWOOD.

WASHING MACHINE.

No. 453,777. Patented June 9, 1891.

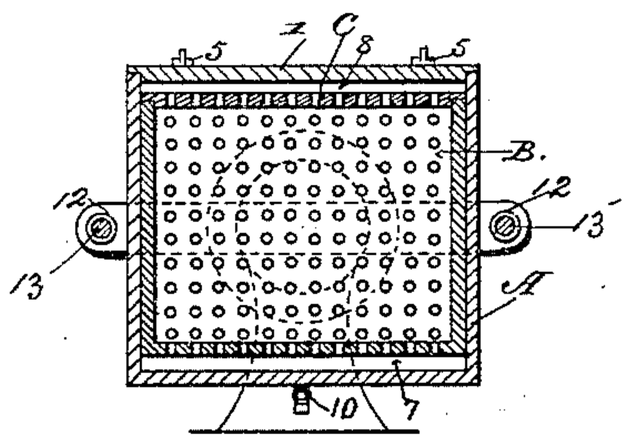

FIG. 4.

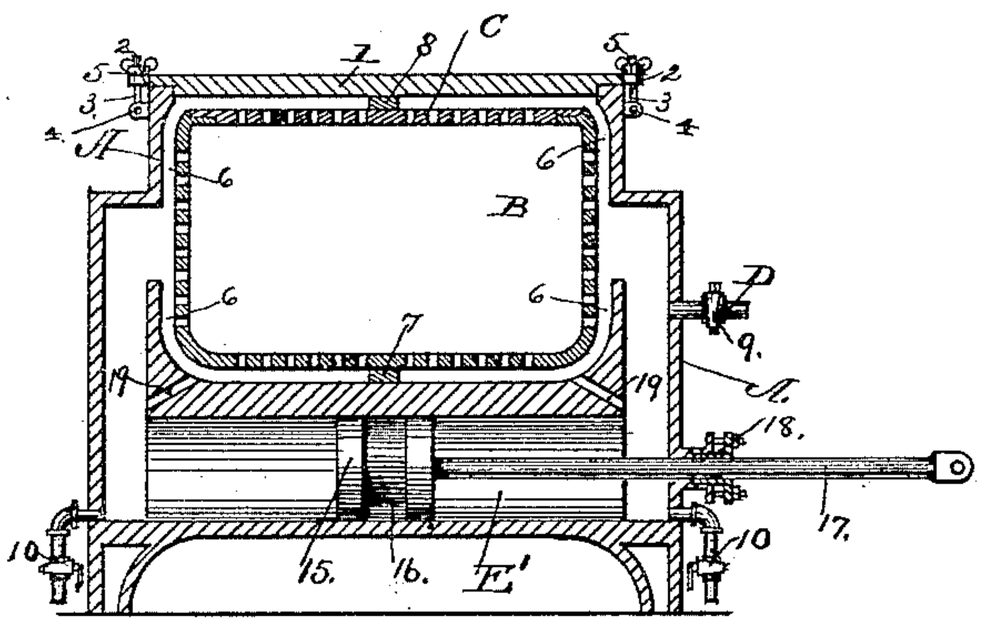

FIG. 5.

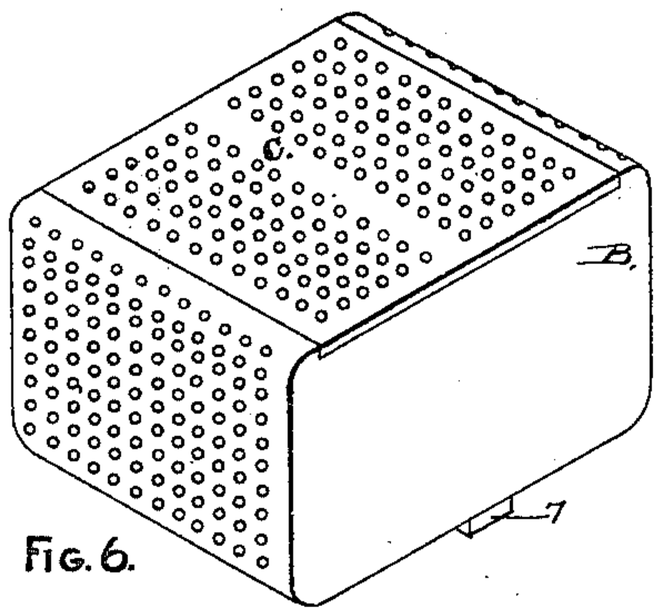

FIG. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM J. NORWOOD, OF ALBANY, NEW YORK.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 453,777, dated June 9, 1891.

Application filed February 19, 1891. Serial No. 382,031. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. NORWOOD, of the city and county of Albany, in the State of New York, have invented new and useful Improvements in Washing-Machines, of which the following is a specification.

My invention relates to improvements in machines for mechanically effecting the washing of clothes and textile fabrics; and it consists of a machine comprising an imperforate outer casing for containing the water or suds, an inner perforated case or cage for containing the articles to be washed, and means, substantially as herein described, for forcibly passing the water or suds through the articles contained in said perforated cage, the water or suds being forced through said articles in alternating opposite directions, so as effect a thorough cleansing of the clothes or other articles contained in said perforated cage.

In the accompanying drawings, which are herein referred to and form part of this specification, Figure 1 is a vertical longitudinal section of one form of my washing-machine. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation. Fig. 4 is a vertical transverse section at the line *x x* on Fig. 3. Fig. 5 is a vertical longitudinal section of a modified form of my washing-machine, and Fig. 6 is a detached perspective view of the perforated inner cage and its cover.

As represented in the drawings, A designates the outer casing of the machine, which is made water-tight and provided with a detachable cover 1, which forms a water-tight joint thereon. Said cover is preferably provided with a series of slotted lugs 2 for receiving the fastening-bolts 3, and in order to render said cover easily detachable said bolts are preferably pivoted, as at 4, to the sides of the casing A, and each of said bolts is provided with a thumb-nut 5, so as to be manipulated without the aid of a wrench.

B designates the inner cage or clothes-receptacle, provided with perforated ends and bottom, but with imperforate sides, the latter being fitted to form a closed joint with the corresponding sides of the casing A. Said cage is made shorter than the length of the casing A, so as to form a passage 6 between said casing and the cage B at each end of the latter. On the lower face of the bottom of the cage B a transverse rib 7 is secured to form a dam which will prevent the flow of water from one end of the casing A to the opposite end underneath the cage B, and a like rib 8 is attached to or fitted to bear upon the cover C of said cage to operate as a dam to prevent the water from flowing over the top of the cage from one end of the casing A to the opposite end, and it will be readily seen that by reason of the obstructive dams 7 and 8 all the water that is forced into one end of the casing A must pass through the perforations of the cage B before reaching the opposite end of said casing A. The cover C is perforated, excepting where the rib 8 rests thereon, and is held in position by the cover 1 of the casing A.

D is a supply-pipe, which conveys the water into the casing A for the purpose of charging the latter, and said pipe is provided with a valve or stop-cock 9, which, when closed, prevents the water from being forced back into the supply-pipe during the operation of forcing the water through the articles in the cage B. The casing A is provided with suitable drainage-pipes and cocks 10, by which the water and suds after being used can be drained from the interior of said casing, and said drainage-pipes may be connected to the drainage system of the building in which the machine is used, or to any preferred method of conducting the waste-water from the premises.

As shown in Figs. 1, 2, and 3, the means for forcing the water through the cage B consists of a pair of single-acting pumps E, of which one is located at each end of the casing A, the inner end of the pump being open to the corresponding passage 6, so as to be charged from and discharged into said passage. Each of said pumps is provided with a piston 11, which is fitted to reciprocate in the cylinder of the pump, and both of said pistons are connected together by means of cross-heads 12 and side rods 13 or other suitable means, so as to move together as one piece, one of said pistons making its outward stroke when the other is making its inward stroke. Guides 14 are provided

for the cross-heads 12, and the reciprocating movements can be imparted to said pistons by means of any suitable motive power.

As represented in Fig. 5, a water-circulating pump E′ is located in the interior of the casing A, directly beneath the cage B, both ends of the pump-cylinder being open and forming direct communication with the corresponding passage 6 for conveying the water into the cage B. Said pump is provided with a piston 15, which is preferably made with a circumferential groove 16, which will become filled with water and form a water packing for said piston. The latter is secured to a piston-rod 17, which passes through the wall of the casing A, through a stuffing-box 18, provided for that purpose, and the outer end of said piston-rod may be connected to any suitable motive power for imparting a reciprocating movement to the piston 15. For the purpose of draining the waste water from the passages 6 beneath the cage B drainage-openings 19 are formed to lead from the lower part of said passages into the ends of the casing A, the latter being provided with the supply-pipe D and the drainage-pipes and cocks 10, described herein in respect to the other form of my invention.

The operation of my invention is as follows: The articles to be washed are placed in the cage B, and water charged with soap is admitted into the casing A through the supply-pipe D until the cage B and its contents are quite submerged, and it will readily be seen that in this operation of filling said casing the pump or pumps of the apparatus will be filled with the inflowing water. The covers C and 1 being fixed in their places and secured, as described, the pump or pumps are set in motion, and thereby the water is forced to pass into the cage at one end, entering therein through the perforations at the bottom end and cover at that end, and escaping through the perforations at the corresponding parts at the opposite end of the cage B until the pump or pumps have completed a stroke in one direction, thereby the water is forced through the articles contained in said cage, and by the return-stroke of the pump or pumps the water is in like manner forced to pass through the articles in the cage B in the opposite direction, and this churning of the water back and forth through the cage B is continued until the articles are thoroughly cleansed, which end can be attained very quickly by a few strokes of the pumping mechanism. When the washing of one charge of the cage B is completed, the drainage-cocks 10 should be opened to allow the waste-water to escape from the apparatus, the covers 1 and C are taken off from their respective places, and the articles removed from the cage B. Then, after recharging the cage and replacing the covers C and 1, the apparatus is ready for a repetition of the operation above described.

What I claim as my invention, and desire to secure by Letters Patent, is—

A washing-machine comprising a water-tight outer casing provided with a detachable cover, a perforated inner cage or clothes-receptacle contained in said casing and provided with a removable cover, oppositely-located water-passages formed by spaces between the inner side of said casing and the outer side of said cage, said water-passages being provided with obstructive dams, which prevent a direct communication between the opposite ends of the machine through said passages, and water-circulating mechanism, whereby currents of water can be forced alternately in opposite directions through said cage, substantially as specified.

WILLIAM J. NORWOOD.

Witnesses:
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